

MAINTENANCE MANUAL

AEGIS CHASSIS ASSEMBLY 19D904781G1

AND

SHELF 19D904780P1

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DESCRIPTION

Aegis Chassis Assembly 19D904781G1 and Shelf 19D904780P1 are utilized in the DVIU cabinet. Eight (8) Aegis Chassis Assemblies can be installed in Shelf 19D904780P1. A fully-loaded DVIU cabinet contains sixteen (16) Aegis Chassis Assemblies within two (2) Shelves. See the Application Assembly Diagram in LBI-39041 for cabinet rack-up diagrams.

Each Aegis Chassis Assembly contains a Power Board and an Indicator Board. This assembly also houses the Aegis Module (VG-9600 or VGE-9600) for the DVIU channel. Although installed in the assembly, the Aegis Module is not a sub-part of the Aegis Chassis Assembly; it must be ordered separately if replacement is required.

Shelf 19D904780P1 is a 19-inch wide 5-rack unit high (8.75-inch) rack-mount shelf which is centered between its eight (8) respective DVIU Interface Units (see the Application Assembly Diagram in LBI-39041). The shelf has no electronics but simply provides mechanical support

for the Aegis Chassis Assemblies inserted into it. Each Aegis Chassis Assembly slides into a slot or "card guide" in the Shelf and is then locked into place by a captive screw located on the bottom front of the unit.

CIRCUIT ANALYSIS

The following circuit analysis information applies to the two printed circuit boards located on the Aegis Chassis Assembly.

INDICATOR BOARD

The Indicator Board is mounted on the front of the Aegis Chassis Assembly. As shown in Figure 1, four (4) small LEDs are viewable from the front of the DVIU cabinet for monitoring purposes. The three green LEDs are used to indicate the status of the +5 Vdc, +12 Vdc and -12 Vdc power sources applied to the DVIU channel. Each

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LED lights-up when power is present on the respective power line.

The fourth LED, red in color, is used to indicate the charge state of the backup batteries installed on the Power Board. As described in the following section, these batteries are only needed if the Aegis Module installed in the Aegis Chassis Assembly is a DES-type module. VGE Aegis Modules and unencrypted Aegis Modules do not require backup batteries. The red **BATT** LED lights when battery replacement is necessary.

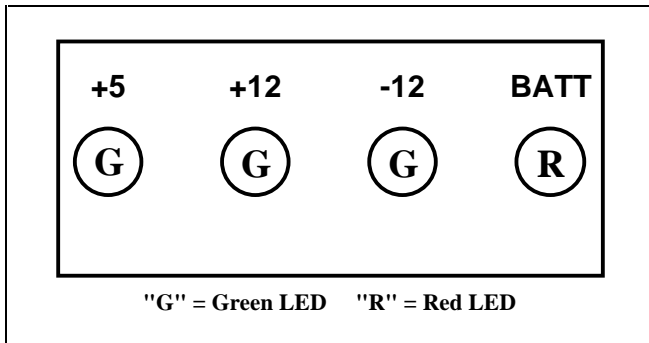


Figure 1 – Indicator Board LEDs

Cable 19B801735P4 interconnects J6 on the Indicator Board to J2 on the Power Board. This 5-wire interconnection is shown on the Interconnection Diagram in LBI-39041.

POWER BOARD

The Power Board is mounted at the back of the Aegis Chassis Assembly just behind the Aegis Module. The primary purpose of this board is to provide fused power interconnections for the Aegis Chassis Assembly. It also accommodates the current-limit components (resistors and a zener diode) for the LEDs on the Indicator Board, the keep-alive batteries (if needed) for the Aegis Module, and the low-battery sense circuit.

Fuses

As shown on the Power Board's schematic diagram, three (3) fuses on the board – F1, F2 and F3 – fuse the dc power interconnections between dc input connector J1 and dc output connector J3. These fuses prevent shorts on the power lines within one DVIU from interrupting power to

the other DVIUs in cabinet. F1 (-12 Vdc fuse) is a ½ ampere fuse. F2 (+12 Vdc fuse) and F3 (+5 Vdc fuse) are both 1 ampere fuses. All are slow-blow type fuses.

LED Current Limit Components

During normal operation, the three (3) dc power LEDs on the Indicator Board will be lit by 2 to 3 milliamperes of forward current. Zener diode VR1 is a 6.8 volt device installed in series with current limit resistor R2 and the +12V LED. It insures this LED will only light when the +12 Vdc power line is above approximately +11.0 Vdc.

Backup Batteries and Battery Sense Circuit (DES DVIUs Only)

A DES Aegis Module (VG-9600) requires an external backup power source to maintain the cryptographic key stored in its internal RAM. Each DES DVIU has two (2) "AA" batteries installed on its Power Board for this "keep-alive" power function. Both batteries are installed in socket XBT1. Keep-alive 3.0 Vdc (nominal) power is delivered to J4 pin 7 at the Aegis Module via J4 pin 2 on the Power Board and Cable 19B802896P1.

The Power Board also has a keep-alive battery sense circuit that lights the red **BATT** LED on the Indicator Board when keep-alive battery replacement is needed. This circuit employs op amp U1.1 operating as a voltage comparator. Resistors R7 and R8 provide a 2.5 Vdc reference voltage at U1 pin 3 from the +12 Vdc power line. With fresh AA batteries installed, the battery voltage at U1 pin 2 is approximately 3.0 Vdc. In this condition, the op amp's output at U1 pin 1 remains low (near the -12 Vdc supply line) and therefore the red **BATT** LED remains off. If the battery voltage at U1 pin 2 falls below 2.5 Vdc, U1 pin 1 transitions high (near the +12 Vdc supply line) and the red **BATT** LED lights.

NOTE

Since AA batteries are not installed in VGE and unencrypted Aegis DVIUs, P5 is removed so the battery sense circuit will not turn on the **BATT** LED.



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**AEGIS CHASSIS ASSEMBLY
19D904781G1**

ISSUE 1

SYMBOL	PART NUMBER	DESCRIPTION
A1		POWER BOARD 19C852346G1
		----- CAPACITORS -----
C1 and C2	T644ACP347K	Polyester: .047 uF ±10%, 50 VDCW.
		----- DIODES -----
D2	19A700028P1	Silicon: 75 mA, 75 PIV; sim to 1N4148.
		----- FUSES -----
F1	19A134961P10	Cartridge: 0.5 Amp Slow-Action; sim to Littelfuse 218.500.
F2 and F3	19A134961P15	Cartridge: 1.0 Amp Slow-Action; sim to Littelfuse 218 001.
		----- JACKS -----
J1	19B802523P30	Header, right angle: 4-position PC board mounting; sim to AMP 1-350944-0.
J2	19A704852P32	Printed wire, two part: 6 contacts, sim to Molex 22-29-2061.
J3	19A704852P30	Printed wire: 4 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2041.
J4	19A704852P28	Printed wire: 2 contacts rated @ 2.5 amps.
J5	19A704852P1	Connector: 2 Pin Male Header.
		----- PLUGS -----
P5	19A702104P2	Connector: Shorting Jumper, Gold Plated. (Housing Color: White).
		----- RESISTORS -----
R1	H212CRP247C	Deposited carbon: 4.7K ohms ±5%, 1/4 w.
R2 and R3	H212CRP222C	Deposited carbon: 2.2K ohms ±5%, 1/4 w.
R4	H212CRP347C	Deposited carbon: 47K ohms ±5%, 1/4 w.
R5	19A701537P1	Composition: 10M ohms ±5%, 1/4 w.
R6	H212CRP247C	Deposited carbon: 4.7K ohms ±5%, 1/4 w.
R7	H212CRP339C	Deposited carbon: 39K ohms ±5%, 1/4 w.
R8	H212CRP310C	Deposited carbon: 10K ohms ±5%, 1/4 w.
		----- INTEGRATED CIRCUITS -----
U1	19A704883P1	Linear: Quad Op Amp; sim to MC3303P.
		----- VOLTAGE REGULATORS -----
VR1	19A700025P8	Silicon, zener: 400 mW max; sim to BZX55-C6V8.
		----- BATTERY HOLDERS -----
XBT1	19A703247P2	Holder, battery: two "AA" style; sim to Keystone 2223.
		----- FUSE SOCKETS -----
XF1 thru XF3	19A116688P2	Clip, fuse: sim to Littelfuse 111501.

SYMBOL	PART NUMBER	DESCRIPTION
		----- MISCELLANEOUS ----- (See drawing 19C852346)
4	N80P13006B6	Machine screw: Pan head, Phillips; No. 8-32 x 3/8"
5	N402P7B6	Flatwasher, narrow: No. 6.
6	N404P13B6	Lockwasher, internal tooth: No. 6.
7	7141225P3	Hex Nut: No. 6-32.
A2		INDICATOR BOARD 19C852419G1
		----- INDICATING DEVICES -----
DS1 thru DS3	19A703595P12	Optoelectric: Green LED; sim to HP HLMP-1503-010.
DS4	19A703595P10	Optoelectric: Red LED; sim to HP HLMP-1301-010.
		----- JACKS -----
J6	19A704852P136	Connector, printed wire, two part: 6 contacts; sim to Dupont Berg 22-12-2064.
A3		INTERCONNECT CABLE 19B801735P4
		----- MISCELLANEOUS ----- (See drawing 19D904781)
2	19D904779P1	Chassis, steel.
3	N80P9004B6	Machine screw: No. 4-40 x 1/4.
4	N402P5B6	Washer: narrow, steel.
5	N404P11B6	Loackwasher, internal tooth, No. 4.
6	19A706152P5	Retainer strap: sim to Panduit Corp. SST-1.

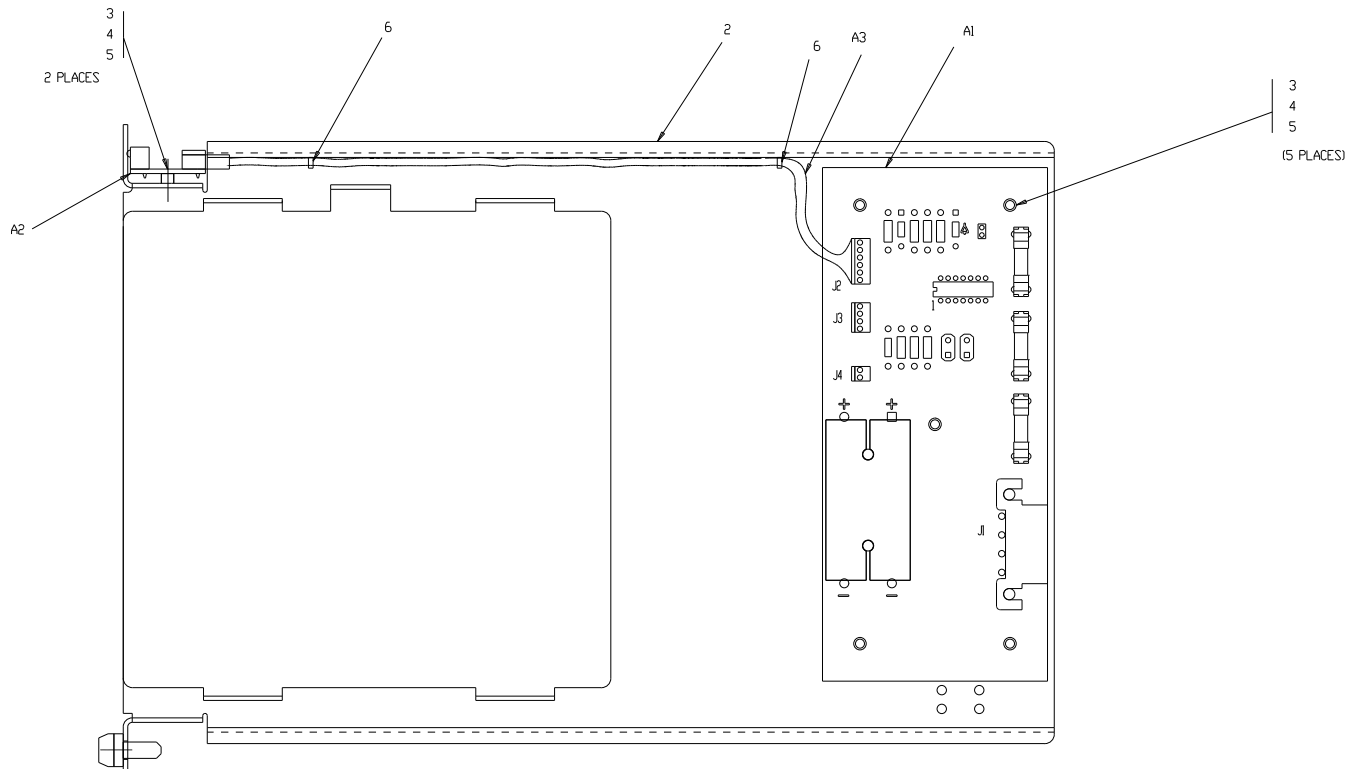
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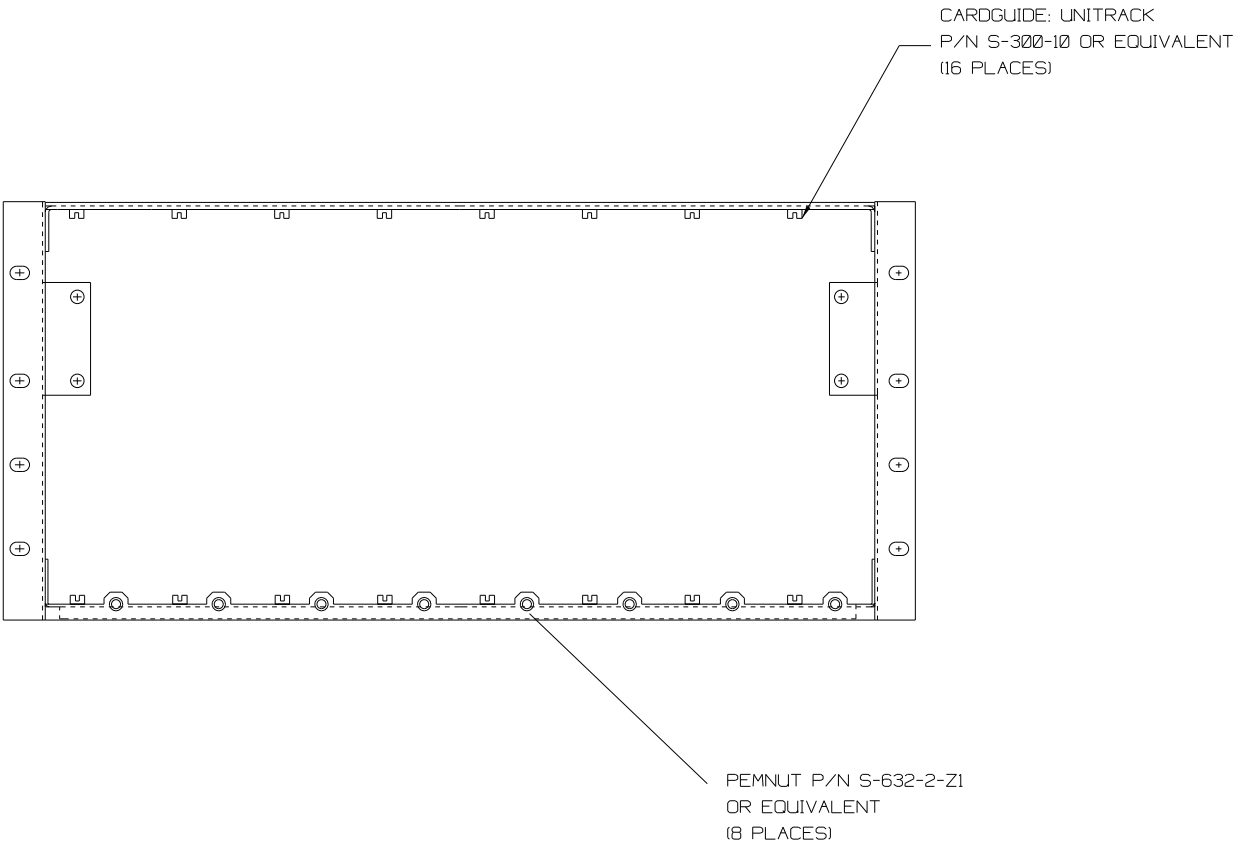
**NOTE**

See the Interconnection Diagram in LBI-39041 for wiring interconnection details.

**AEGIS CHASSIS ASSEMBLY
19D904781G1**

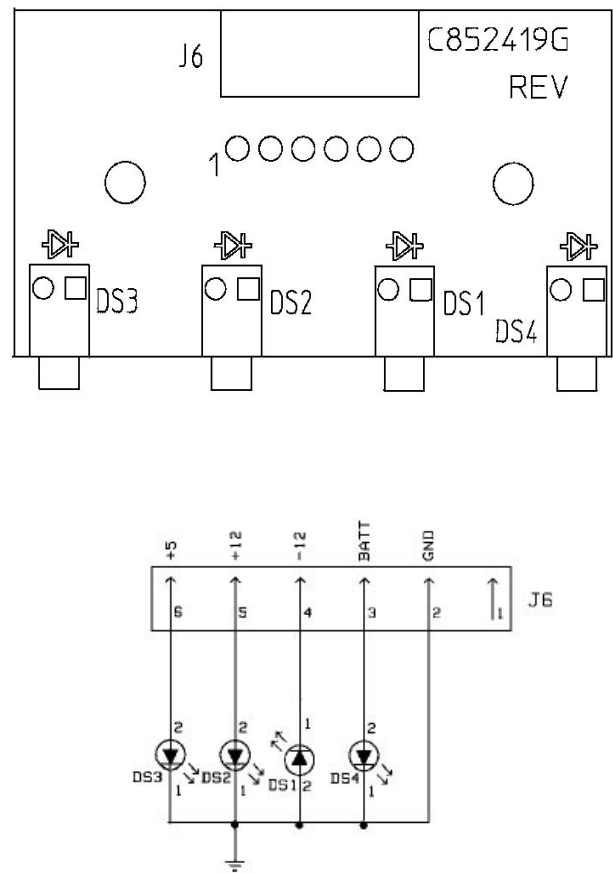
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FRONT VIEW



SHELF
19D904780P1

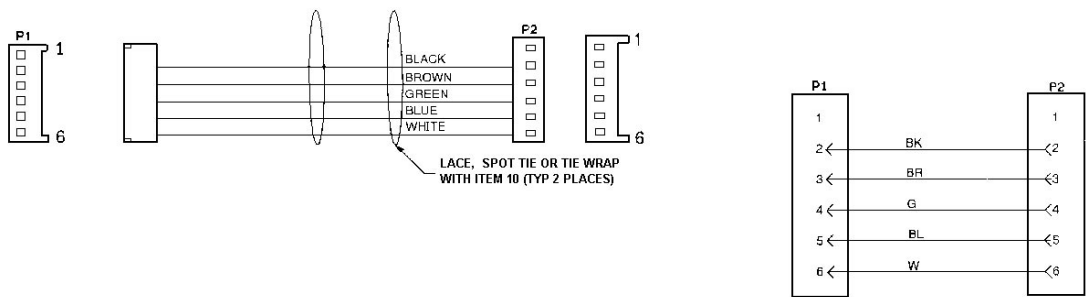
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INDICATOR BOARD

19C852419G1

(19C852419, Rev. 0)
(19C852421, Rev. 0)



ITEM	GE PART NO	VENDOR PART NO. (OR EQUIVALENT)	DESCRIPTION	QTY
P1 & P2	19A700041P32	MOLEX 22-91-2065	6 PIN CONNECTOR	1
1	19A704779P26	MOLEX 08-55-0101	CONTACT	10
2	19A115870P2	UL 1007	WIRE #22-BK	12 IN
3	19A115870P3	UL 1007	WIRE #22-BR	12 IN
4	19A115870P5	UL 1007	WIRE #22-GR	12 IN
5	19A115870PG	UL 1007	WIRE #22-BL	12 IN
7	19A115870P12	UL 1007	WIRE #22-W	12 IN
10	19J706162P5	PANDUIT SST-1M	TIE WRAP	2

CABLE

19B801735P4

(19B801735, Sh. 4, Rev. 5)



(19C852346, Rev. 3)
(19C852347, Rev. 3)